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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,835	03/18/2004	Xavier Fourquin	IPG-PT107	4262
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VOLPE AND KOENIG, P.C. UNITED PLAZA, SUITE 1600 30 SOUTH 17TH STREET PHILADELPHIA, PA 19103				
EXAMINER				
HAN, QI				
ART UNIT		PAPER NUMBER		
2626				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/802,835

Applicant(s)

FOURQUIN ET AL.

Examiner

QI HAN

Art Unit

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/CD)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Response to Amendment

3. This communication is responsive to the applicant's amendment and RCE both filed on 03/01/2010. The applicant(s) amended the specification (see the amendment: pages 2).

Response to Arguments

4. In response to applicant's arguments regarding the rejection for second limitation element ("a converter configured to convert...") of claim 1 under 35 USC 103 that "At least because Pawate discloses that the pitch is estimated from the artist's vocal and not that the artist's vocal is converted into a pitch, Pawate does not disclose this feature of Applicants' claim 1" (see Remarks: page 15, paragraph 4), examiner respectfully disagrees with the applicant's argument and has a different view of the prior art teachings and claim interpretations. It is noted that

Pawate clearly teaches that user's vocal (analog signal) via a microphone (with necessary or inherent analog-to-digital (A/D) converter) is input to 'pitch estimator 23 (which outputs an estimated/converted pitch that corresponds to the fundamental frequency)' in a digital signal processor 13 (Figs. 2 and 2a and col. 2, lines 43-57 and col. 8, lines 52-53), so that the prior art teachings properly read on the rejected limitation. It is also noted that the above argument that the **estimated** pitch is not **converted** pitch, is not persuasive because: (i) the claimed limitation only indicates converting **analog** signal into a **digital** signal **comprising** a fundamental frequency, not converting it into pitch itself as argued; and/or (ii) no where in the specification shows how to specifically convert analog signal into a pitch (or fundamental frequency) (so that the rejection based on broadest reasonable interpretation in light of the specification is proper). Finally, it is should pointed that the applicant fails to treat the combined prior art teachings as a whole and to treat the rejected claim limitation as broadest reasonable interpretation in light of the specification, wherein Pawate implies/ suggests processing user's vocal in 'digital domain' and estimating/changing the pitch (or fundamental frequency) of user's vocal in same or similar way as applied to speech (col. 3, lines 37-65, col. 4, lines 43-61 and col. 7, lines 30-41), and wherein Boss further expressly teaches the corresponding limitations that Pawate lacks and other supports/motivations for the combination, as rejected (see detail in the claim rejection).

5. In response to applicant's arguments regarding the rejection for limitation elements 3 and 4 (i.e. "storing..." and "extracting...") of claim 1 under 35 USC 103 that "it appears that the Examiner is arguing that Applicants' "storing" and "extracting steps" equate to storing a pitch on a CD and then extracting the pitch from the CD. However, Applicants' claim 1 recites "storing a

set of coded data" and "extracting a digital music signal from the set of coded data (Emphasis added by applicant)" (see Remarks: pages 15-16, bridge paragraph), it is noted that the examiner made the corresponding change in the rejection for reflecting/responding the arguments (see detail in the corresponding rejection below). It should also be pointed out that even though these recited/augured portions of the claim limitations are rejected by using Pawate's teachings and based on broadest reasonable interpretation, the claim rejection should be considered as whole, based on the combination of both Pawate and Boss teachings with the corresponding obviousness/motivation analysis, as rejected. However, it can be seen that the applicant **only** alleged that "the examiner has not established a prima facie case of obviousness" (remarks: page 16, paragraph 2), but totally silenced about Boss teachings and failed to provide specific and/or persuasive argument/evidence against the obviousness (or motivation) analysis provided by the examiner in the previous rejection.

Claim Rejections - 35 USC § 103

6. Claims 1-7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over PAWATE et al. (US 5,641,927) hereinafter referenced as PAWATE in view of BOSS et al. (US 5,915,237) hereinafter referenced as BOSS.

As per **claim 1**, PAWATE discloses 'autokeying for musical accompaniment playing apparatus (audio device)' (title), comprising:

"receive an analog [speech] signal [representing a spoken message]" (Fig.2, 'user's vocal'),

“convert the analog [speech] signal into a digital [speech] signal comprising at least one [speech] signal fundamental frequency” (Figs. 2-2a show that ‘user’s vocal’ (analog signal) via a microphone (with necessary or inherent analog-to-digital (A/D) converter) inputs to ‘pitch estimator 23 (which outputs an estimated/converted pitch that corresponds to the fundamental frequency)’ of/in a digital signal processor 13 (Figs. 2 and 2a and col. 2, lines 43-57),

“store a set of coded data [representing a musical score comprising a set of notes, each note being defined by a note fundamental frequency, a duration, and an instrument that plays said note]” (col. 2, lines 54-67, ‘the key (corresponding to pitch) of the music may also be stored in the CD data (set of coded data) field so not have to be computed’, wherein the set of coded data is broadly interpreted as a sequence of keys or pitches data in the CD data field and other music data in the CD),

“extract a digital music signal from the set of coded data” (col. 2, lines 46-67, ‘provide voice cancellation by subtracting (canceling the voice)...’, ‘the pitch estimated and averaged from the original artist’s voice (musical signal), or key (corresponding to pitch) from the background music or that from the CD data field is compared (necessarily extracting music from the related data)’, wherein the music signal after vocal canceller is read on the claimed digital music signal), and

“combine (mix) a first portion of the digital [speech] signal and a first portion of the digital music signal to produce a combined digital signal” (col. 3, lines 1-40, ‘change the key (portion of music) of background music’ and ‘output (produce) to the mixer 13a to add the user’s vocal (portion of the input digital signal); also see Figs. 2 and 2a).

It is noted that PAWATE does not expressly disclose the input signal being “**speech** signal representing a spoken message” and the coded data “representing a musical score comprising a set of notes, each note being defined by a fundamental frequency, a duration, and an instrument that plays said note”. However, this feature is well known in the art as evidenced by BOSS who discloses ‘representing speech using MIDI (musical instrument digital interface)’ (title), comprising well known feature of MIDI data for generating music including ‘identifying a musical instrument (i.e. piano, clarinet) for music generation, turning on a note (reflecting a musical score) or altering a parameter in order to generate or control sound’ (col. 2, lines 7-30), which necessarily/inherently includes parameter data of pitch (corresponding to fundamental frequency) and the related time stamps (corresponding to duration) for the music note; ‘encoding a digitized speech into a standard digital format, such as MIDI’ (col. 2, lines 67 to col. 3, line 5); and using ‘a MIDI compatible signal’ for processing and storing ‘speech segments (speech signal representing a spoken message)’ in ‘the phoneme dictionary’ including parameters of ‘pitch’ and ‘duration’ (col. 5, line 45 to col. 6, line 28). BOSS also discloses ‘mixer 204, ...receives a digitized speech signal...and a digitized music signal... and mixes the two signals together to form a single audio output’ (col. 13, lines 30-45), which further supports the claim rejection. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify PAWATE by providing a compatible standard digital format, such as MIDI, for representing a speech and/or music signals, as taught by BOSS, for the purpose (motivation) of efficiently representing, storing and transmitting sound/audio signal(s) including music and/or speech signals (BOSS: col. 2, lines 27-29 and 56-61; col. 13, lines 58-61).

As per **claim 2** (depending on claim 1), PAWATE in view of BOSS further discloses “a digital signal processor comprising the mixer” (PAWATE: col. 2, line 45 and Fig. 1, block 13).

As per **claim 3** (depending on claim 1), it is noted that the combined references disclose using the mismatch between the two estimated pitches (corresponding to fundamental frequencies) of user and reference (background music) to change (substantially replace) the key (or pitch) of background music (PAWATE : col. 3, lines 1-16 and Figs. 2-2a), which is different from claimed “replace the fundamental frequency of the speech signal by the fundamental frequency associated with a note of the music signal.” However, it would have been obvious to one of ordinary skill in the art to use the same mismatch to change (replace) user’s pitch instead of reference’s pitch in the same manner, so as to produce the predictable result of the user’s speech with a characteristic of the reference’s (music’s) pitch. It is noted that estimating and comparing pitches uses the same known technique (as taught by PAWATE), and changing (replacing) pitch from one to the other (i.e. from reference’s pitch to user’s pitch, or from user’s pitch to reference’s pitch) uses the same known method, so that, one of ordinary skill in the art would have recognized that solving the difference based on the teachings of PAWATE in view of BOSS would have been obvious to the skilled person in the art, because the implementation would be within the scope of capability of the skilled person in the art and the result would be predictable. Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

As per **claim 4** (depending on claim 3), PAWATE in view of BOSS further discloses “the fundamental frequency of the speech signal is replaced by the fundamental frequency associated with the note of the music signal during a period substantially equal to the duration of the note”

(BOSS: col. 5, lines 1-47, since the speech encoded into MIDI compatible signal, the time stamp (inherent feature reflecting duration) of a note in music could be easily used to associate with the related phoneme duration, as claimed).

As per **claim 5** (depending on claim 1), PAWATE in view of BOSS further discloses “add to the combined digital signal a second portion of the digital speech signal” (PAWATE: col. 3, line 8 ‘to add the user’s vocal’ reads on second portion of said digital speech signal; col. 4, lines 13-56, ‘envelop’, ‘residual’ and ‘lpc’ can also be broadly interpreted as second portion of said digital speech signal).

As per **claim 6** (depending on claim 1), PAWATE in view of BOSS further discloses “add to the combined digital signal a second portion of the digital music signal” (PAWATE: col. 3, lines 1-16, wherein other music portions excluding key (or pitch) can be broadly interpreted as second portion of said digital music signal).

As per **claim 7** (depending on claim 1), PAWATE in view of BOSS further discloses “replace at least one harmonic frequency of the fundamental frequency of the speech signal with a harmonic frequency of the fundamental frequency associated with a note of the musical signal” (PAWATE: col. 8, lines 1-4, ‘indicate second or third harmonic’; BOSS: col. 6, lines 29-53, ‘measure the pitch of the phoneme represented by the received phoneme pattern by...spectral compression and harmonic matching method’; col. 7, line 25 to col. 8, line 26, ‘MIDI standard’ that inherently includes parameter for timbre (corresponding to harmonic)’; one of ordinary skill in the art would have recognized that the result of matching harmonic(s) could be used for changing (or replacing) certain harmonic(s) of the user or reference (music) in the same/similar

way as for changing/replacing pitch, so that the output audio (result) would have a sound characteristic of harmonic(s) of the music (achieving predictable result), and vice versa).

As per **claim 10** (depending on claim 1), PAWATE in view of BOSS further discloses “a vocoder configured to code the combined digital signal” (PAWATE: col. 3, line 63, ‘phase vocoder’; col. 4, lines 47-61, ‘residual resampling method’ with ‘LPC’ (vocoder feature); BOSS: ‘the MIDI speech signal output...may transmitted over ...wireless communication, or telephone lines’, so that one of ordinary skill in the art would have recognized that coding the processed signal would be the same as coding normal speech signal by using a vocoder).

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over PAWATE in view of BOSS applied to claim 1, and further in view of KAGEYAMA et al. (US 5,857,171) hereinafter referenced as KAGEYAMA.

As per **claim 8** (depending on claim 1), even though PAWATE in view of BOSS discloses “mixer” as stated above (see claim 1), PAWATE in view of BOSS does not expressly disclose “discriminating a consonant from a vowel in said digital speech signal” and adapted to activate the mixer. However, the feature is well known in the art as evidenced by KAGEYAMA who discloses ‘a vowel/consonant separator 40 (discriminator)’ so that ‘the consonant and vowel components can be separated (discriminated) from each other by detecting a fundamental frequency’ and ‘the vowel synthesizer 43 generates the vowel signal at the pitch specified by the pitch calculator based on the phoneme data distributed by the phoneme data register 48’ (Fig.2 and col. 6, line 60 to col. 7, line 52), and teaches that ‘the phoneme data track of the song data records only the vowel data of the original or model signer...’, which suggests that the system is

adapted to activate a mechanism (i.e. mixer) for mixed signal (after envelope generator 44, Fig 2) during detection of the vowel, as claimed. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify PAWATE in view of BOSS by providing a mechanism of separating vowel/consonant and activating a mixer for a mixing process during detection of vowel, as taught by KAGEYAMA, for the purpose (motivation) of creating a harmony voice having a tone other than that of user (actual player, or karaoke singer) (KAGEYAMA: col. 1, lines 31-32).

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over PAWATE in view BOSS applied to claim 1, and further in view of KAGEYAMA et al. (US 5,712,437) hereinafter referenced as KAGEYAMA2.

As per **claim 9** (depending on claim 1), PAWATE in view of BOSS does not expressly disclose “a **voice activity detector** configured to control the mixer.” However, the feature is well known in the art as evidenced by KAGEYAMA2 who discloses ‘if the detected state of the signing performance indicates a no voice period’, some functions/structures ‘are disabled’ (col. 5, lines 43-55), which suggests that system has a mechanism (i.e. mixer) of detecting voice activity (so as being a voice activity detector) and determining whether or not a function/component is disabled (so as controlling the function/component). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the mixing means disclosed by PAWATE and BOSS with a mechanism of detecting voice activity for controlling certain function/component as taught by KAGEYAMA2, for the purpose (motivation) of generating a harmony audio signal containing an additional harmony

part and/or determining to stop (or start) to harmony sound generation (KAGEYAMA2: abstract and col. 5, lines 54-55).

9. Claims 11-18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over PAWATE in view BOSS applied to claim 1, and further in view of TANIGUCHI et al. (US 5,712,437) hereinafter referenced as TANIGUCHI.

As per **claim 11**, the rejection is based on the same reason described for claim 1 because the claim recites the same or similar limitations as claim 1, except the preamble limitation “a telecommunication terminal”. However, the feature is well known in the art as evidenced by TANIGUCHI who discloses ‘music player applicable to portable telephone terminal’ (title), comprising ‘portable telephone terminal (a telecommunication terminal) incorporating a music player device’, ‘CPU’ and ‘speech processor’ for ‘coding/decoding on speech signals’ and producing ‘hold sound mixed with received speech’ (col. 3, line 30 to col. 4, line 11). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify PAWATE in view BOSS by providing a portable telephone terminal and mixing sound with speech, as taught by TANIGUCHI, for the purpose (motivation) of generating BGM (background music) mixed with received speech signals for the system (TANIGUCHI: col. 16, lines 34-56).

In addition, in another view of teachings of PAWATE and BOSS, since PAWATE in view BOSS discloses using ‘a computer system’ implementing the MIDI encoding/decoding systems and including ‘a modem for communicating with one or more other computers via the internet, telephone lines or other transmission medium’ (BOSS: col. 11, line 58 to col. 12, line

16), the computer system can be broadly interpreted as claimed “a telecommunication terminal”. This means that the disclosure by PAWATE in view BOSS can also satisfy the claim for the rejection, based on broadest reasonable interpretation of the claim in light of the specification.

As per **claim 12** (depending on claim 11), PAWATE in view of BOSS and TANIGUCHI further discloses “transmit the combined digital signal to another terminal **in real time**” (TANIGUCHI: col. 9, lines 14-30).

Regarding **claims 13-18 and 21** (depending on claim 11), the rejection is based on the same reason described for claims 2-7 and 10, because the claims recite the same or similar limitations as claims 2-7 and 10 respectively.

10. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over PAWATE in view of BOSS and TANIGUCHI applied to claim 11, and further in view of KAGEYAMA.

Regarding **claim 19** (depending on claim 11), the rejection is based on the same reason described for claim 8, because the claims recites the same or similar limitations as claim 8.

11. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over PAWATE in view BOSS and TANIGUCHI applied to claim 11, and further in view of KAGEYAMA2.

Regarding **claim 20** (depending on claim 11), the rejection is based on the same reason described for claim 9, because the claim recites the same or similar limitations as claim 9.

Conclusion

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to QI HAN whose telephone number is (571)272-7604. The examiner can normally be reached on M-TH:9:00-19:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QH/qh
May 20, 2010
/Qi Han/
Primary Examiner, Art Unit 2626